# The Clear Skies Act of 2002



Mary Jo Krolewski, USEPA

National CHP Turbine Technology And Regulatory Forum

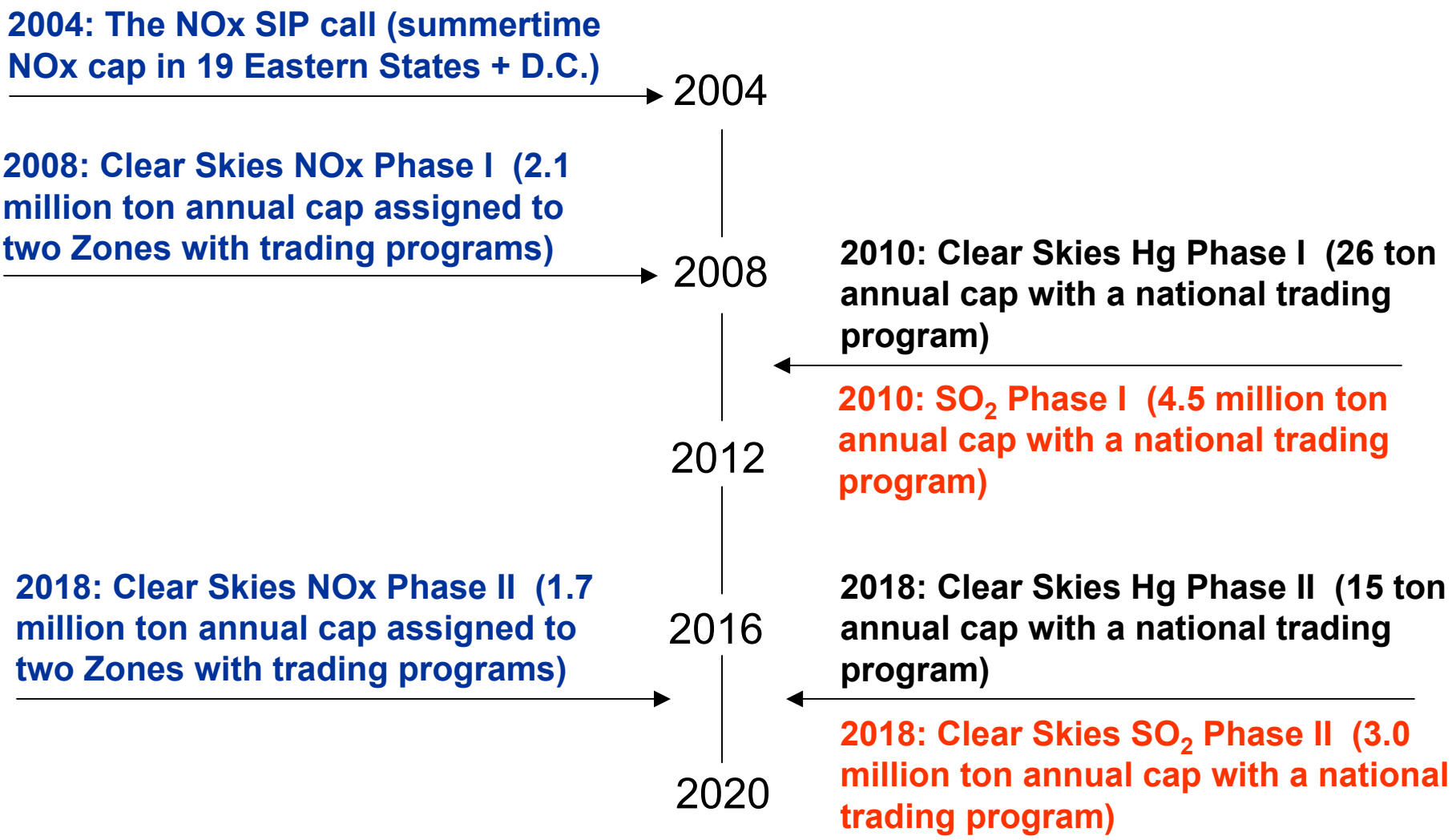
March 5-6, 2003

# Introduction

- On February 14, 2002, President Bush proposed the Clear Skies Initiative, a mandatory program for the control of sulfur dioxide ($SO_2$), nitrogen oxides ($NO_x$) and mercury (Hg) from the electricity generation sector.

- On February 27, 2003, Chairman Billy Tauzin and Chairman Joe Barton introduced the Clear Skies Act in the U.S. House of Representatives, and Senator George Voinovich and Chairman Jim Inhofe introduced the legislation in the Senate by request of the Administration.

# Caps and Timing for the Electric Power Sector under the Clear Skies Act



# Clear Skies: Results Sooner and Cheaper

## Why Clear Skies?

- Air quality has improved, but problems remain
- Emissions from power generation remain a major cause of health-impacting fine particles and ozone, regional haze, acid rain, eutrophication, and mercury
- Power plants remain the major source of cost-effective reductions
  - EPA is taking major steps to reduce fine particle and NOx emissions from on-road and off-road diesel sources

## Clear Skies Would:

- Deliver dramatic progress towards achievement of critical health and environmental goals
- Extend and strengthen proven market-based approach of Title IV
- Increase certainty and reduce costs across the board -- for industry, states, and citizens

# Clear Skies Delivers Environmental and Public Health Benefits

- Reduced fine particle and ozone exposure by 2020 would result in $93 billion in annual public health benefits, including:
  - 12,000 fewer premature deaths;
  - 7,400 fewer cases of chronic bronchitis;
  - 15 million fewer days with respiratory illnesses and symptoms; and
  - 12,000 fewer hospitalizations and ER visits
    - An alternate estimate projects 7,200 fewer premature deaths and annual health benefits totaling $11 billion

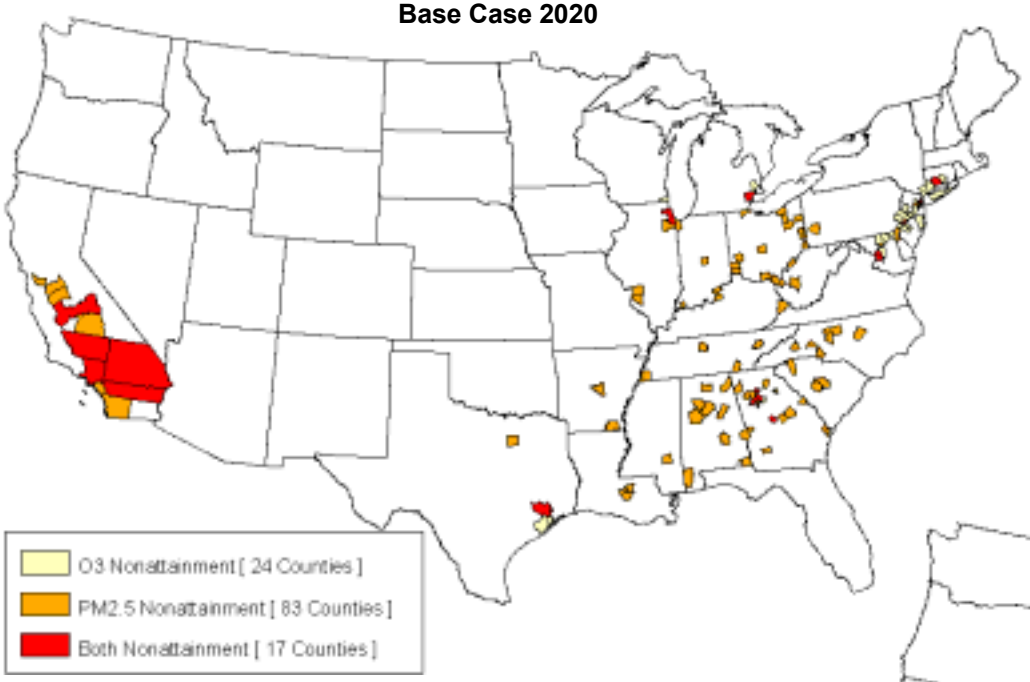
- Visibility would be significantly improved in parks and forests
  - $3 billion in annual visibility benefits for southern and western parks alone by 2020

- Reductions in sulfur, nitrogen, and mercury deposition would improve the health of lakes, streams, and estuaries
  - Virtual elimination of chronically acidic lakes in the Northeast

- Additional human health and environmental benefits cannot currently be monetized (e.g., mercury risk reduction)

# Projected Attainment with $PM_{2.5}$ and 8-hour Ozone Standards under Clear Skies (2020)

**Base Case 2020**




$PM_{2.5}$ attainment status in 2020:

- Based on initial modeling, the Clear Skies Act would bring 54 additional counties (home to approximately 21 million people) into attainment with the fine particle standard (as compared to the Base Case).

**Clear Skies 2020**

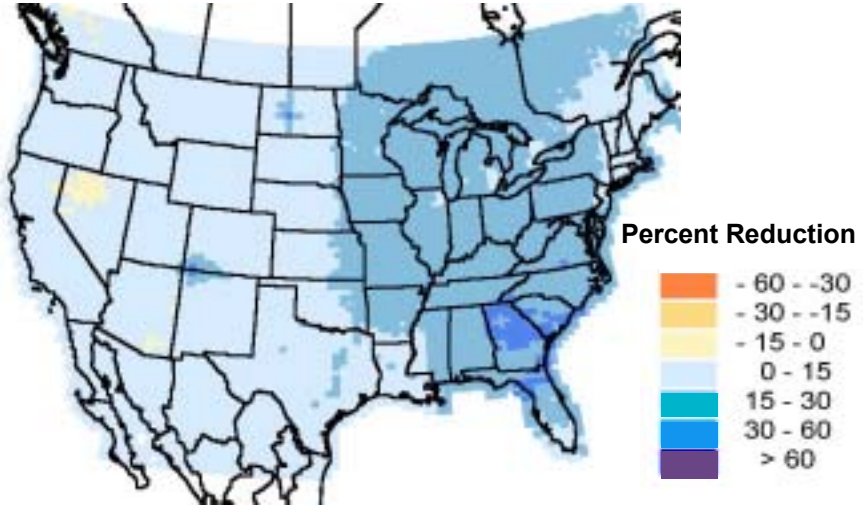

Ozone attainment status in 2020:

- Based on initial modeling, the Clear Skies Act would bring 8 additional counties (home to over 4 million people) into attainment with the 8-hour ozone standard (as compared to the Base Case).

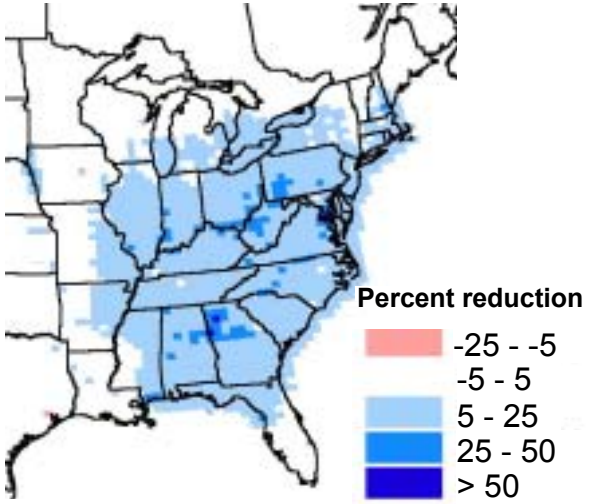
**Note**: This analysis shows the counties that would come into attainment due to Clear Skies alone in 2020. Additional federal and state programs are designed to bring all counties into attainment by 2017 at the latest.

# Environmental Improvements Under Clear Skies

**Nitrogen Deposition**
**Percent Change 2020 Base Case vs. Clear Skies**



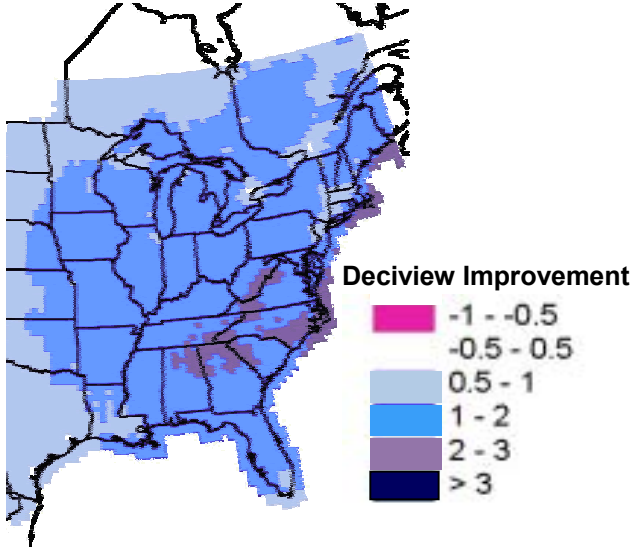

**Mercury Deposition**
**Percent Change 2020 Base Case vs. Clear Skies**




**Clear Skies would:**

- Significantly improve visibility over much of the East and Midwest. In the West, Clear Skies would prevent further deterioration of air quality, including visibility.
- Reduce the amount of nitrogen entering Eastern and Gulf estuaries and coastal waters
- Reduce exposure to mercury through consumption of contaminated fish.

**Visibility**
**Deciview Change 2020 Base Case vs. Clear Skies**



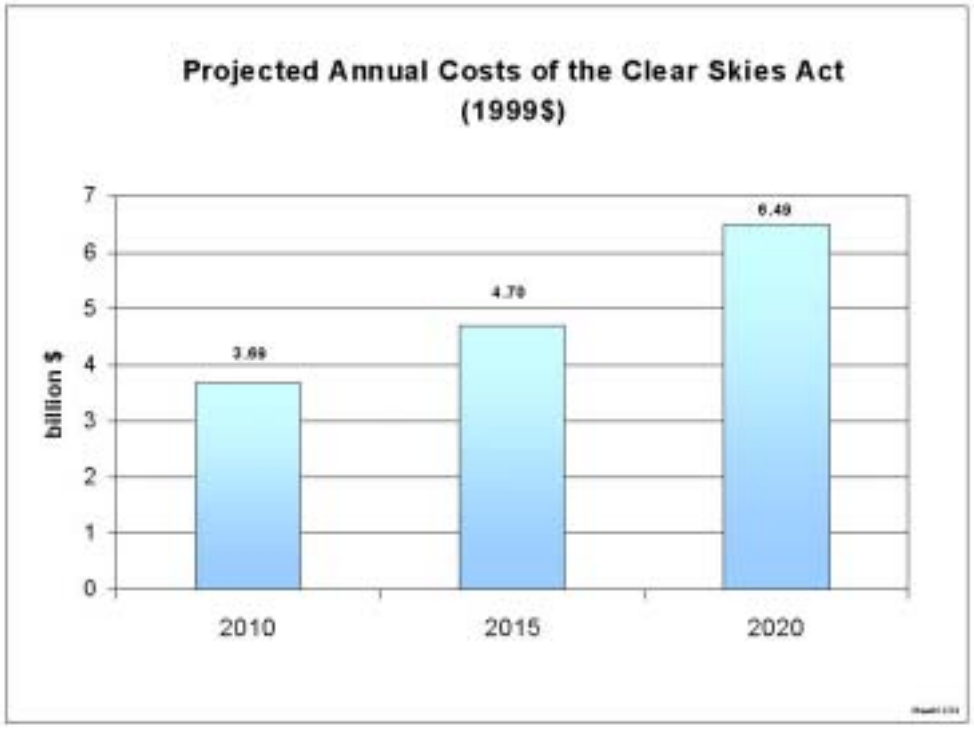
# Clear Skies Design Provides Certainty and Flexibility at Low Cost

- Provides certainty across the board
  - Certainty for industry to allow effective corporate and regulatory planning
  - Certainty for State and local governments that emissions reductions would be achieved
  - Certainty for consumers that electricity prices would not increase significantly
  - Certainty for all Americans that public health and the environment can be protected at a national and a local level
- Delivers substantial benefits while minimizing economic impacts

# Projected Costs of the Clear Skies Act

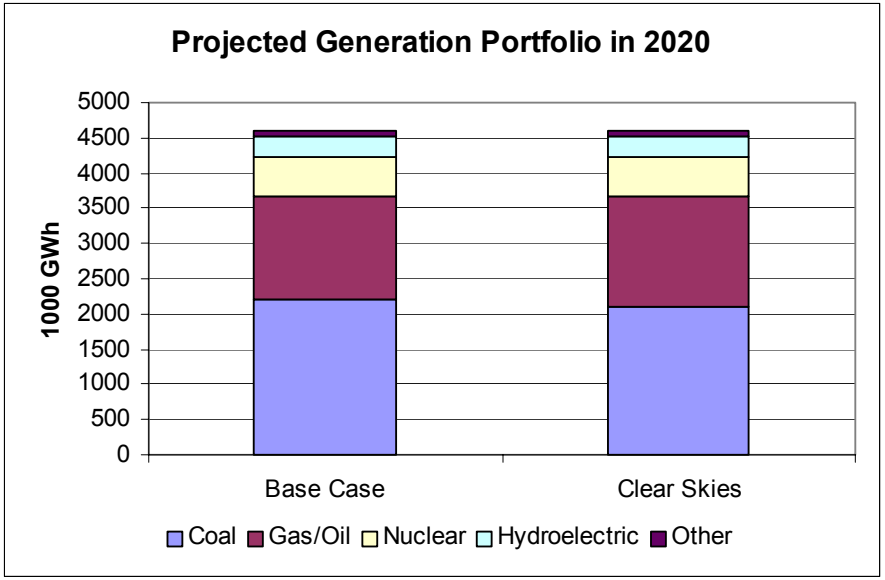
- **Annual production costs are projected to be $3.7 billion in 2010 and $6.5 billion on 2020.**
  - Clear Skies phases in large reductions gradually.

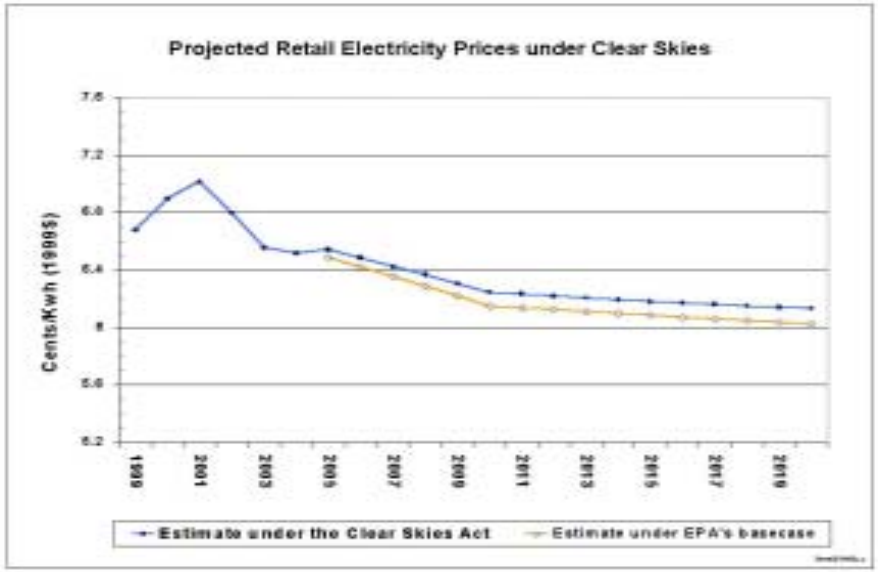
- **Regulatory certainty would allow for strategic planning of capital (e.g., avoid stranded investments).**



# Generation Portfolio and Electricity Price Forecast

- Emission reductions are phased in over time, avoiding dramatic change in fuel use.
  - Reductions are achieved through installation of controls and not through fuel switching.




- Downward trend in retail electricity prices continues.

# Affected Sources under Clear Skies

**Definition of Affected Units**:

- For $SO_2$ and NOx, the program will cover all fossil fuel-fired boilers and turbines serving an electric generator unit with a nameplate capacity greater than 25 MW and producing electricity for sale, except cogeneration units that produce for sale less than 1/3 of the potential electrical output of the generator that they serve.
- For mercury, the program will cover all *coal-fired* units serving an electric generator with a nameplate capacity greater than 25 MW; the same exclusion for cogenerators applies as for NOx and $SO_2$ .
- For new units, there would not be a generator size cut-off, except for new gas-fired units under 25 MW. New units would have the same cogeneration exception as existing units.

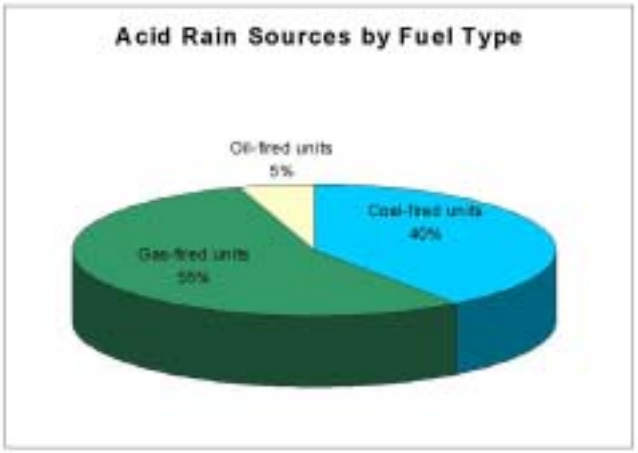
**Factors Considered in Defining Coverage:**

- Since 1990, there have been dramatic changes in the electric power industry associated with the emergence of competitive markets for electricity generation.
  - Most new generation comes from non-utility generators.
  - Many existing "utility" plants are being purchased by Independent Power Producers (IPPs) and operate as non-utility wholesale power suppliers.
  - Applicability of the program should recognize the emergence of competitive markets.
- The need for emissions reductions from the electricity generating sector was balanced with the desire to not discourage combined heat and power (CHP).
- The program includes units generating significant amounts of electricity that compete in the electricity generation market.

# Affected Sources under Clear Skies

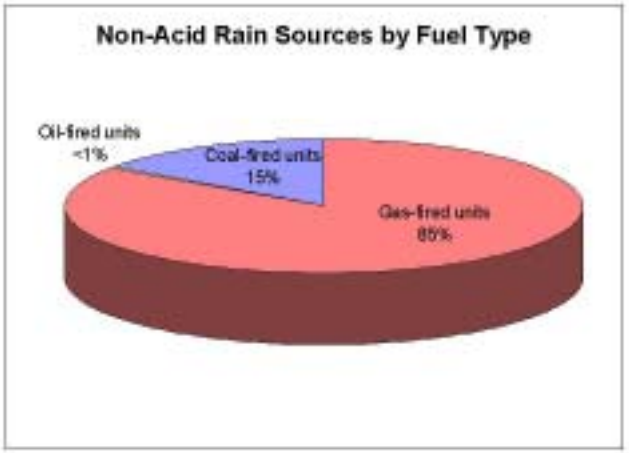
- Sources covered under the Clear Skies Act would include the 2,792 Acid Rain Program electric generating units.
- As many as 400 additional electric generating units, currently not in the Acid Rain Program, may be covered by the Clear Skies Act.
  - This number is based on units in the IPM analysis, which includes all electric generating units with firm sales contracts to the electric grid
  - This number likely over-estimates the number of units, since cogeneration units that sell less than one-third of their generation are excluded.

**Gas-fired sources represent the largest percentage of Acid Rain units. In 2000, Acid Rain sources emitted about 11.2 million tons of $SO_2$ and 5.11 million tons of NOx.**




Source: EPA 2000 Scorecard

**The majority of non-Acid Rain units are gas-fired. In 2000, these non-Acid Rain sources emitted about 90,000 tons of $SO_2$ and 160,000 tons of NOx.**




Source: NEEDS 2000 database

# Clear Skies Allocations

- $NO_X$ Allocations primary based on heat input. (for all affected units operating as of December 31, 2004)
- $SO_2$ allocations largely based on pro-ration of existing Title IV allowances
  - 95% of allocated allowances allocated to owners of existing Title IV allowances
  - 3.5% of allocated allowances allocated to owners of affected units that were not originally allocated allowances under Title IV and that commenced operation before January 1, 2001
  - 1.5% of allocated allowances allocated to owners of affected units that commenced operation between January 1, 2001 and January 1, 2005
- Mercury allocations: heat input adjusted to reflect the types of coal combusted by the unit.
- For the first year of the trading program, 99% of the allowances would be allocated; the remaining 1% would be auctioned.
  - Gradual allocation phase-out to auction over 52 years

# Clear Skies Opt-in Provisions

**Opt-ins:** Fossil fuel-fired boilers, turbines, and IGCC plants that are not otherwise subject to the new $SO_2$, $NO_x$, and mercury trading programs may opt into these programs if certain requirements are met.

- Require a 50% reduction in baseline emissions to be eligible for opt-in.
- Once a unit opts into the new trading programs, it cannot withdraw.
- Opt-in units must vent all their emissions through a stack or duct and must meet the monitoring and reporting requirements for the trading programs, except that each unit must be separately monitored.

# Emissions Standards for New Units

- Clear Skies establishes performance standards for all new boilers, combustion turbines, and IGCCs that are affected under the new trading programs.
  - The standards cover $SO_2$, $NO_x$, mercury, and particulate matter (PM) and are, in general, considerably tighter than existing New Source Performance Standards
  - A PM limit is established for existing oil-fired boilers to ensure control of nickel (HAP)

- All units subject to a performance standard must monitor emissions using a continuous emission monitoring system (CEMS) and use averaging times similar to new source performance standards.
- These standards must be reviewed and, if appropriate, revised every 8 years.
- States or the Administrator may still adopt standards or other more stringent requirements for affected units

**Performance Standards for New Units**

| | $SO_2$ (lb/MWh) | $NO_x$ (lb/MWh) | Hg (lb/GWh) | PM (lb/MWh) |
|---|---|---|---|---|
| Boilers, IGCCs, & Coal-fired CTs | 2.0 | 1.0 | 0.015 | 0.2 |
| Oil/wood fired CTs | 2.0 | 0.289-1.01 | - | 0.2 |
| Gas-fired CTs | - | 0.084*-0.56** | - | - |

**Note**: $NO_x$ limits for oil/gas-fired CTs depend on whether the unit is a simple cycle CT, uses add-on controls, is located within 50 km of a class I area, or is dual-fuel capable.

*** Combined cycle w/in 50 km of class I area or uses add on controls (3.5 ppm). Combined cycle >50 km w/o add on controls limit is 0.21 (9ppm).**

**** Simple Cycle any location (15 ppm).**

# Exemptions to NSR & BART for New and Existing Units

- **Clear Skies exempts new and existing affected units from New Source Review (NSR) and the requirement to install best available retrofit technology (BART).**
  - Affected units under exemption are no longer considered “major emitting facilities” or “major stationary sources” for purposes of Parts C and D of Title I of the Clean Air Act.

- **To qualify for the exemption from NSR and BART, existing sources must meet certain minimum requirements.**
  - Existing sources must either commit within three years to meet the existing limit for PM of 0.03 lb/MMbtu in the future, or have begun to properly operate any existing control technology to reduce PM emissions or otherwise reduce PM emissions according to best operational practices.
  - An existing unit must also use good combustion practices to minimize emissions of CO.
  - If an existing unit makes modifications that increase emissions at maximum capacity, it must either comply with performance standards for $SO_2$, $NO_x$, PM, and CO emissions under Section 481 or comply with BACT

- **New and modified affected sources are subject to Part C/D requirements near class I areas as well as preconstruction review for NAAQS attainment/maintenance**
  - Affected sources constructing within 50 km of a class I area after enactment remain subject to increment and air quality related values review
  - States must ensure that the construction of new or modified affected units will not cause or contribute to a violation of the national ambient air quality standards (NAAQS) and must also provide the public with an opportunity to comment on the impact of the affected unit on the NAAQS.

# The Outlook for Multi-Pollutant Legislation

- Enactment of multi-pollutant legislation has many advantages to all stakeholders:
  - Immediate and long-term health and environmental benefits
  - Less burden on State and local governments
  - Lower costs for industry and consumers

- The 108th Congress has a unique opportunity to reduce the electric power industry's emissions and improve the cost-effectiveness of environmental policy.

- The Administration is committed to working with Congress to pass multipollutant legislation.


*For Additional Information, Visit*
Clear Skies Website
www.epa.gov/clearskies